

Notice of Allowance dated 8-15-2006

Appl. No. 10/527,302

Amdt. After Allowance dated 8-21-2006

Attorney Docket No. 1217-050600

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) An apparatus for identifying a liquid type of a gasoline, comprising:

a gasoline liquid type identifying chamber for causing an identified gasoline introduced into a liquid type identifying apparatus body to stay temporarily;

a liquid type identifying sensor heater provided in the gasoline liquid type identifying chamber; and

a liquid temperature sensor provided in the gasoline liquid type identifying chamber apart from the liquid type identifying sensor heater at a constant interval,

the liquid type identifying sensor heater including a heater and an identifying liquid temperature sensor provided in the vicinity of the heater, and

the apparatus further comprising an identification control portion;

the identification control portion being constructed so that a pulse voltage is applied to the liquid type identifying sensor heater for a predetermined time, and the identified gasoline staying temporarily in the gasoline liquid type identifying chamber is heated by the heater and the liquid type is identified with a voltage output difference (V0) corresponding to a temperature difference between an initial temperature and a peak temperature in the identifying liquid temperature sensor.

2. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the voltage output difference (V0) is equal to a voltage difference between an average initial voltage (V1) obtained by sampling an initial voltage before application of the pulse voltage at a predetermined number of times and an

average peak voltage (V2) obtained by sampling a peak voltage after the application of the pulse voltage at a predetermined number of times, that is,

$$V0 = V2 - V1.$$

3. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the identification control portion identifies a type of a gasoline with the voltage output difference (V0) obtained for the identified gasoline, which is based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline prestored in the identification control portion.

4. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the identification control portion correlates a liquid type voltage output (Vout) for the voltage output difference (V0) at a measuring temperature of the identified gasoline with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

5. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the liquid type identifying sensor heater is a laminated liquid type identifying sensor heater in which a heater and an identifying liquid temperature sensor are laminated through an insulating layer.

6. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the heater and the identifying liquid temperature

sensor in the liquid type identifying sensor heater are constituted to come in contact with the identified gasoline through a metallic fin, respectively.

7. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 1, wherein the liquid temperature sensor is constituted to come in contact with the identified gasoline through a metallic fin.

8. (Previously Presented) A method for identifying a liquid type of a gasoline, comprising the steps of:

applying a pulse voltage for a predetermined time to a liquid type identifying sensor heater including a heater and an identifying liquid temperature sensor provided in the vicinity of the heater;

heating an identified gasoline by the heater; and

identifying the liquid type with a voltage output difference (V0) corresponding to a temperature difference between an initial temperature and a peak temperature in the identifying liquid temperature sensor.

9. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein the voltage output difference (V0) is equal to a voltage difference between an average initial voltage (V1) obtained by sampling an initial voltage before application of the pulse voltage at a predetermined number of times and an average peak voltage (V2) obtained by sampling a peak voltage after the application of the pulse voltage at a predetermined number of times, that is,

$$V0 = V2 - V1.$$

10. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein a type of a gasoline is identified with the voltage output difference (V0) obtained for the identified gasoline, based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline which is prestored.

11. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein a liquid type voltage output (Vout) for the voltage output difference (V0) at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and is thus corrected.

12. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein the liquid type identifying sensor heater is a laminated liquid type identifying sensor heater in which a heater and an identifying liquid temperature sensor are laminated through an insulating layer.

13. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein the heater and the identifying liquid temperature sensor in the liquid type identifying sensor heater are constituted to come in contact with the identified gasoline through a metallic fin, respectively.

14. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 8, wherein the liquid temperature sensor is constituted to come in contact with the identified gasoline through a metallic fin.

15. (Previously Presented) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 1 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

16. (Previously Presented) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 8.

17. (Previously Presented) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 1 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

18. (Previously Presented) A method for reducing an exhaust gas of a car, comprising the steps of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 8, and

regulating an ignition timing based on the type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

19. (Previously Presented) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 1 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

a gasoline compression control device for regulating a compressibility of the gasoline based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

20. (Previously Presented) A method for reducing an exhaust gas of a car, comprising the steps of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 8, and regulating a compressibility of the gasoline based on the type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

21. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 2, wherein the identification control portion identifies a type of a gasoline with the voltage output difference (V0) obtained for the identified gasoline, which is based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline prestored in the identification control portion.

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22. (Currently Amended) The apparatus for identifying a liquid type of a gasoline according to claim 2, wherein the identification control portion correlates a liquid type voltage ~~output~~ output (Vout) for the voltage output difference (V0) at a measuring temperature of the identified gasoline with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

23. (Previously Presented) The apparatus for identifying a liquid type of a gasoline according to claim 3, wherein the identification control portion correlates a liquid type voltage output (Vout) for the voltage output difference (V0) at a measuring temperature of the identified gasoline with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and thus carries out a correction.

24. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 9, wherein a type of a gasoline is identified with the voltage output difference (V0) obtained for the identified gasoline, based on calibration curve data to be a correlation of a voltage output difference with a temperature for a predetermined reference gasoline which is prestored.

25. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 9, wherein a liquid type voltage output (Vout) for the voltage output difference (V0) at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined reference gasoline and is thus corrected.

26. (Previously Presented) The method for identifying a liquid type of a gasoline according to claim 10, wherein a liquid type voltage output (V_{out}) for the voltage output difference (V_0) at a measuring temperature of the identified gasoline is correlated with an output voltage for a voltage output difference at a measuring temperature for a predetermined threshold reference gasoline and is thus corrected.

27. (Previously Presented) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 2 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

28. (Previously Presented) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 3 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

29. (Previously Presented) An apparatus for identifying a liquid type of a gasoline of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 4 which is provided in one of a gasoline tank, or on an upstream side or a downstream side of a gasoline pump.

30. (Previously Presented) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 9.

31. (Previously Presented) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 10.

32. (Previously Presented) A method for identifying a liquid type of a gasoline of a car, comprising the step of:

identifying a type of a gasoline in a gasoline tank or on an upstream side or a downstream side of a gasoline pump by using the method for identifying a liquid type of a gasoline according to claim 11.

33. (Previously Presented) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 2 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

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34. (Previously Presented) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 3 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.

35. (Previously Presented) An apparatus for reducing an exhaust gas of a car, comprising:

the apparatus for identifying a liquid type of a gasoline according to claim 4 which is provided in a gasoline tank or on an upstream side or a downstream side of a gasoline pump; and

an ignition timing control device for regulating an ignition timing based on a type of the gasoline which is identified by the apparatus for identifying a liquid type of a gasoline.